

-2-

**Amendments to the Claims**

Please amend Claim(s) 5, 6, 14, 15, 23, 24, 32, and 33. The Claim Listing below will replace all prior versions of the claims in the application:

**Claim Listing**

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1. (Original) A data processing system comprising:  
memory; and  
a pointer to a location in memory, the pointer comprising:  
a block field defining a block size;  
a length field defining a number of blocks in a segment of memory;  
an address pointing into the segment of memory; and  
a finger field which denotes a block of the segment of memory into which the address points.
2. (Original) A system as claimed in claim 1 wherein the pointer to a location in memory further includes a permission field which indicates how a process may access data within the segment of memory.
3. (Original) A system as claimed in claim 2 wherein the pointer to a location in memory further comprises a capability field which identifies the pointer to a location in memory as a capability pointer having bounds and permission defined therein.
4. (Original) A system as claimed in claim 3 which bounds the segment of memory to the number of blocks indicated by the length field, each block of size  $2^B$  where B is a value defined in the block field.
5. (Currently Amended) A system as claimed in claim 1 wherein a base address is computed from the address in the pointer to a location in memory by setting the B least significant bits of the address equal to zero, where B is the block size, and subtracting a block index indicated by the finger field from the base bits of the address excluding the B least significant bits.

-3-

6. (Currently Amended) A system as claimed in claim 1 wherein the length field is encoded such that the number of blocks is indicated by adding a defined constant to the value in the length field for all but a the smallest range of numbers and a the smallest block size.
7. (Original) A system as claimed in claim 1 wherein the pointer to a location in memory further includes an increment-only bit which when set causes the system to exclude negative offsets to the address in the pointer.
8. (Original) A system as claimed in claim 7 wherein the address of the pointer to a location in memory points to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.
- B<sub>1</sub> 9. (Original) A system as claimed in claim 1 wherein the memory representation includes a block field, length field and finger field, respectively, for each of a segment of memory and a subsegment within the segment of memory.
10. (Original) A method of representing data in a data processing system comprising:
  - defining a block size in a pointer to a location in memory;
  - defining in the pointer to a location in memory a number of blocks in a segment of memory;
  - defining in the pointer to a location in memory an address pointing into the segment of memory; and
  - defining in the pointer to a location in memory a block of the segment of memory into which the address points.
11. (Original) A method as claimed in claim 10 further comprising indicating in the pointer to a location in memory how a process may access data within the segment of memory.

-4-

12. (Original) A method as claimed in claim 11 further comprising identifying within a pointer to a location in memory that the representation is a capability pointer having bounds and permission defined therein.
13. (Original) A method as claimed in claim 12 wherein the pointer to a location in memory defines a number of blocks indicated by a length field, each block of size  $2^B$  where B is a value defined in a block field.
14. (Currently Amended) A method as claimed in claim 10 further comprising computing a base address from the address in the pointer to a location in memory by setting the B least significant bits of the address equal to zero, where B is the block size, and subtracting a block index from the base bits of the address excluding the B least significant bits.
15. (Currently Amended) A method as claimed in claim 10 further comprising determining the number of blocks defined by the memory representation by adding a defined constant to a value in a length field for all but a the smallest range of numbers and a the smallest block size.
16. (Original) A method as claimed in claim 10 further comprising excluding negative offsets to the address in the memory representation where an increment-only bit is included in the representation.
17. (Original) A method as claimed in claim 16 wherein the address of the pointer to a location in memory points to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.
18. (Original) A method as claimed in claim 10 wherein the memory representation includes a block field, length field and finger field, respectively, for each of a segment of memory and a subsegment within the segment of memory.

-5-

19. (Original) A computer program product comprising:
- a computer usable medium for storing data; and
  - a set of computer program instructions embodied on the computer usable medium, including a pointer to a location in memory, the pointer comprising:
    - a block field defining a block size;
    - a length field defining a number of blocks in a segment of memory;
    - an address pointing into the segment of memory; and
    - a finger field which denotes a block of the segment of memory into which the address points.
20. (Original) A computer program product as claimed in claim 19 wherein the pointer to a location in memory further includes a permission field which indicates how a process may access data within the segment of memory.
21. (Original) A computer program product as claimed in claim 20 wherein the pointer to a location in memory further comprises a capability field which identifies the pointer to a location in memory as a capability pointer having bounds and permission defined therein.
22. (Original) A computer program product as claimed in claim 21 which bounds the segment of memory to the number of blocks indicated by the length field, each block of size  $2^B$  where B is a value defined in the block field.
23. (Currently Amended) A computer program product as claimed in claim 19 wherein a base address is computed from the address in the pointer to a location in memory by setting the B least significant bits of the address equal to zero, where B is the block size, and subtracting a block index indicated by the finger field from the base bits of the address excluding the B least significant bits.
24. (Currently Amended) A computer program product as claimed in claim 19 wherein the length field is encoded such that the number of blocks is indicated by adding a defined

-6-

constant to the value in the length field for all but a the smallest range of numbers and a the smallest block size.

25. (Original) A computer program product system as claimed in claim 19 wherein the pointer to a location in memory further includes an increment-only bit which when set causes the system to exclude negative offsets to the address in the pointer to a location in memory.
26. (Original) A computer program product as claimed in claim 25 wherein the address of the pointer to a location in memory points to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.
27. (Original) A computer program product as claimed in claim 19 wherein the memory representation includes a block field, length field and finger field, respectively, for each of a segment of memory and a subsegment within the segment of memory.
28. (Original) A computer data signal comprising a pointer to a location in memory, the pointer comprising:
- a block field defining a block size;
  - a length field defining a number of blocks in a segment of memory;
  - an address pointing into the segment of memory; and
  - a finger field which denotes a block of the segment of memory into which the address points.
29. (Original) A computer data signal as claimed in claim 28 wherein the pointer to a location in memory further includes a permission field which indicates how a process may access data within the segment of memory.

-7-

30. (Original) A computer data signal as claimed in claim 29 wherein the pointer to a location in memory further comprises a capability field which identifies the pointer to a location in memory as a capability pointer having bounds and permission defined therein.
31. (Original) A computer data signal as claimed in claim 30 which bounds the segment of memory to the number of blocks indicated by the length field, each block of size  $2^B$  where B is a value defined in the block field.
32. (Currently Amended) A computer data signal as claimed in claim 28 wherein a base address is computed from the address in the pointer to a location in memory by setting the B least significant bits of the address equal to zero, where B is the block size, and subtracting a block index indicated by the finger field from the base bits of the address excluding the B least significant bits.
33. (Currently Amended) A computer data signal as claimed in claim 28 wherein the length field is encoded such that the number of blocks is indicated by adding a defined constant to the value in the length field for all but a the smallest range of numbers and a the smallest block size.
34. (Original) A computer data signal as claimed in claim 28 wherein the pointer to a location in memory further includes an increment-only bit which when set causes the system to exclude negative offsets to the address in the pointer to a location in memory.
35. (Original) A computer data signal as claimed in claim 34 wherein the address of the pointer to a location in memory points to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.

-8-

36. (Original) A computer data signal as claimed in claim 28 wherein the memory representation includes a block field, length field and finger field, respectively, for each of a segment of memory and a subsegment within the segment of memory.
37. (Previously Presented) A data processing system comprising:  
memory; and  
a pointer to a location in memory, the pointer comprising:  
a block field defining a block size;  
a length field defining a number of blocks in a segment of memory; and  
an address pointing into the segment of memory to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory
38. (Previously Presented) A method of representing data in a data processing system comprising:  
defining a block size in a pointer to a location in memory;  
defining in the pointer to a location in memory a number of blocks in a segment of memory; and  
defining in the pointer to a location in memory an address pointing into the segment of memory to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.
39. (Previously Presented) A computer program product comprising:  
a computer usable medium for storing data; and  
a set of computer program instructions embodied on the computer usable medium, including a pointer to a location in memory, the pointer comprising:  
a block field defining a block size;  
a length field defining a number of blocks in a segment of memory; and

-9-

an address pointing into the segment of memory to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.

- B1
40. (Previously Presented) A computer data signal comprising a pointer to a location in memory, the pointer comprising:
- a block field defining a block size;
  - a length field defining a number of blocks in a segment of memory; and
  - an address pointing into the segment of memory to the base address of a memory region within the segment, all portions of the memory segment not within the memory region having addresses less than the address in the pointer to a location in memory.
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